solidification temperatures of up to 3500°F are substantially prevented from forming plugs in said throat.--

--11. The quench gasifier according to claim 1 wherein said heating element comprises graphite.--

--12. The quench gasifier according to claim 1 wherein said refractory material is selected from the group consisting of silicon carbide and silicon nitride.--

--13. The quench gasifier according to claim 1 wherein said face is substantially resistant to damage from metal oxides.--

--14. The quench gasifier according to claim 1 wherein said face is substantially resistant to damage from vanadium oxides.--

--15. The quench gasifier according to claim 1 wherein said throat has an inner surface having a wind tunnel profile.--

--16. The quench gasifier according to claim 1 wherein said throat further comprises a layer of insulating refractory material behind said electrical heating element.--

--17. The quench gasifier according to claim 1 wherein said inlet has an inlet diameter, said outlet has an outlet diameter, and the ratio of the inlet diameter to the outlet diameter is at least about 3.--

--18. The quench gasifier according to claim 17 wherein said ratio is from about 3 to about 7.--

--19. The quench gasifier according to claim 1 wherein the quench chamber comprises a quench ring substantially axially adjacent to said throat outlet, such that said quench gasifier does not include a plenum chamber.--

--20. The quench gasifier according to claim 19 wherein said quench ring has an inner diameter that is greater than the diameter of said throat outlet, said quench ring inner diameter being sufficiently large to substantially prevent damage to said quench ring.--

--21. A quench gasifier for gasifying ash-containing hydrocarbon feedstocks, comprising:

a combustion chamber for partially oxidizing the carbon in said feedstock to produce synthesis gases; and

a quench chamber adjacent said combustion chamber;

wherein said combustion chamber includes a throat for directing said gases from the combustion chamber to the quench chamber and said throat comprising:

a face comprising a material selected from the group consisting of silicon carbide and silicon nitride; and

an electrical heating element behind said face, said heating element comprising graphite,

wherein said face is substantially resistant to damage from ash deposits comprising metal oxides.--

--22. A method for gasifying ash-containing hydrocarbon feedstocks comprising:

partially oxidizing the feedstock by mixing a feed stream, the feed stream comprising an oxidant, said feedstock, and a temperature moderator, in a combustion chamber comprising a reaction zone under conditions sufficient to produce synthesis gases with a predetermined carbon conversion rate, said conditions including a temperature of about 2000 – 3000°F; and

electrically heating a portion of the combustion chamber to a temperature elevated above 3000 °F.--

--23. The method of claim 22 wherein said oxidant is oxygen and wherein the synthesis gas production is increased without increasing the consumption of the oxygen.--

--24. The method of claim 22 wherein the synthesis gas production is increased without increasing the consumption of the feedstock.--

--25. The method of claim 22 wherein the temperature moderator is steam.--

--26. The method of claim 22 wherein the temperature moderator is carbon dioxide.--

--27. The method of claim 22 wherein the electrical heating comprises exposing said chamber portion to electromagnetic radiation.--

--28. The method of claim 22 wherein the electrical heating comprises applying electrical current to a resistor that is adjacent to said chamber portion.--

--29. The method of claim 22 wherein said portion includes substantially the entire hot face of the combustion chamber, such that the feed stream is preheated electrically, eliminating the use of a preheat burner.--